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| **Lesson Title:** Energy Transfer |
| **Subject area / course / grade level:** 5th grade Science |
| **Introduction:** Discuss the Power Point “Energy Transfer” |
| **Lesson Length:** 45 minutes |
| **Materials:** Paper, crayons or markers, scissors, computer, promethean, textbook, science notebook, popcorn, glass bowl, microwave, coffee pot to heat water and bowl, extension cord (old one to cut or that has been cut by the weed eater ☺.) |
| **Lesson Overview:**  Conduction, convection, radiation, insulators, and conductors. |
| **Tennessee Standards:**  **SPI 0507.10.2** Use data from an investigation to determine the method by which heat energy is transferred from one object or material to another. |
| **Lesson objective(s):**  The students will be able to distinguish between conduction, convection, and radiation, as well as, conductors and insulators. |
| **ENGAGEMENT**  Students will work in groups of 4 to complete 4 activities on “How heat moves.”   1. Hot water temperature will be measured and compared to the temp of ice water. (convection) 2. A hot bowl will be used to melt an ice cube. (conduction) 3. A microwave will be used to pop a bag of popcorn. (radiation)   4. An extension cord will be used to answer questions on conductors and insulation. Each group needs to draw label the cord parts as conductors or insulators. |
| **EXPLORATION**  The engagement activity will allow student exploration and engagement with hands-on experiences to differentiate between conduction, convection, radiation, conductors and insulators. |
| **EXPLANATION**  Report out on each lab activity from engagement activity. The students will share their finding from each station.  Teacher will guide discussions with questioning techniques based upon individual learning levels.   * List higher order thinking questions which teachers will use to solicit *student* explanations and help them to justify their explanations. |
| **ELABORATION**    The student will analyze one real world example of convection, conduction, radiation, conductors and insulators by either describing it in complete sentences or by illustrations.  Vocabulary words- conduction, convection, radiation, conductors and insulators. |
| **EVALUATION**  Create a foldable of the three types of thermal energy transfer. Share and compare with the group. Open discussion guided by questioning. Construct a “T” chart of conductors and insulators. Open discussion guided by questioning. |